

Interactive comment on “Evaluating the Potential of PPK Direct Georeferencing for UAV-SfM Photogrammetry and Precise Topographic Mapping” by He Zhang et al.

Anonymous Referee #3

Received and published: 2 April 2019

The manuscript evaluated the repeatability of PPK UAV flight missions for precise topographic mapping. It is well structured and well written providing sufficient literature background and state-of-the-art methods. Results are presented from different perspectives and discussed broadly. The manuscript provides a contribution to the current debate of emerging PPK UAV data acquisition workflows that can be of interest to the readership of Earth Surface Dynamics. However, I encourage the authors to revise the manuscript based on some minor comments.

Scientific comments:

- 1) Compared to the entire manuscript, the introduction is very long, and some para-

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graphs could be more concise as most of the text builds on the general knowledge base (e.g. general camera parameters, exterior orientation). Even though the authors stress the aims of the research, the novelty of this contribution is a bit fuzzy, as much research in this field has been done already. Efficiency is mentioned as one of the main objectives; however, there is little evidence on this in the results/discussion section as those parts mainly focus on repeatability/reproducibility.

- 2) Comparing metrical horizontal/vertical residuals of datasets with different GSD might not be the best approach, and normalized residuals could be more appropriate

- 3) Line 3 page 6: Can you provide more information on the decision not to use a cross-flight pattern or a single perpendicular strip as recommended by various authors?

- 4) Did your UAVs also record attitude parameters? In the manuscript, you should make clear why you used some observations of the external orientation parameters and others not.

- 5) You used Pix4D as a kind of black-box program. Which settings did you choose for camera calibration and the accuracy for geotagging information?

- 6) What are the reasons for the artificial quadratic pattern in the DoD of the DSLR in Figure 6a (upper left picture) – this almost looks like a kind of systematic error. This pattern needs to be explained in the text.

- 7) Some results are not very clear to the reader. I recommend extending the results section with some more explanation to enhance readability.

Technical corrections:

- 1) Figures: Check consistency of font and readability of legends

- 2) There are some typos and grammar mistakes – I recommend English proofreading prior to publication

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